

Technical Data Sheet

Bridge Identification:	1490230000000B01
Facility Carried:	US 2
Feature Intersected:	Cut River
Location:	Hendricks Township
County:	Mackinac
Region:	Superior
Year Built:	1941/1946
Year Reconstructed:	1953, 1979, and 1992
Bridge Type:	Cantilever Deck Truss
No. of Spans:	5
Deck Area:	24,249 S.F.
Paint System:	Type 4
Paint Area:	84,000 S.F.
Comments:	Historic Structure



View Looking West (1)

Fracture Critical Members
1. Tie-Down Members at Abutments 2. Truss Tension Members 3. Truss Joints

Fatigue Sensitive Details
1. Tack Welds

General Bridge Description

Bridge B01 of 49023 is a five-span, steel, continuous deck truss bridge carrying U.S. Route 2 over the Cut River in the Hendricks township in Mackinac County. The three deck truss spans measure 125'-0", 300'-0", and 125'-0" from west to east. Behind each 1-foot-wide abutment backwall is a 43'-0" reinforced concrete tee beam span, making the overall length of the bridge 641'-0". The out-to-out width of the deck is 37'-10", providing for two 12'-0" travel lanes with a 3'-0" shoulder and a 3'-0" sidewalk along each edge of the roadway. The bridge is supported by reinforced concrete abutments and solid shaft reinforced concrete piers. Abutments and piers are clad in stone masonry.

The floor system is comprised of longitudinal stringers and transverse floorbeams, which frame into the two deck trusses along either edge of the bridge. Span 2 contains a 50'-0" suspended span that is supported by seated assemblies at the end of the trusses cantilevered from Spans 1 and 3. Tie-down assemblies consisting of steel pin and link members anchor the trusses at the abutments.

The bridge substructure was built in 1941 and the superstructure was built in 1946. The superstructure was painted in 1979. The bridge was rehabilitated in 1992, when the hold-down members for the anchor spans were replaced. The bridge is a twin of Bridge B03 of 51021 (M 55 over the Pine River).



View Looking West (2)

Inspection Checklists

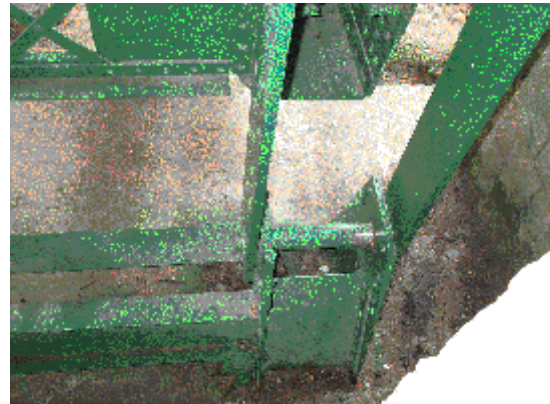
For additional information and detailed inspection procedures, refer to the Inspection and Maintenance Program section of this manual.

Fracture-Critical Members/Fatigue-Sensitive Details

- !** **Tie-down members at abutments.** These pin and link assemblies (Photos 3 through 6) serve to anchor the trusses in Spans 1 and 3. The pin and link assemblies should be carefully inspected for cracks and loss of section and to ensure that they are free to move as intended.



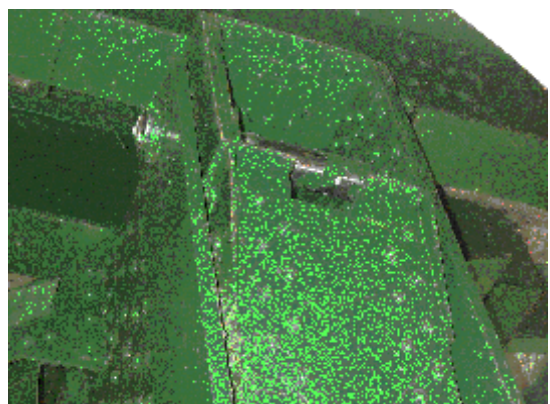
Overall View of Tie-Down (3)



NE Tie-Down Bottom Pin (4)



NE Tie-Down Top Pin (5)



NE Tie-Down Top Pin (6)

The bottom portion of the tie-down assembly is embedded in the abutment concrete. The resulting box configuration tends to accumulate dirt and debris that trap moisture at these locations (Photo

7). Check for corrosion and any associated section loss on these members at the abutment interface (Photo 8).



Debris in Tie-Down (7)



Section Loss on Tie-Down (8)

! **Truss tension members.** Truss tension members should be considered fracture-critical and should receive a careful inspection for section loss and cracks. To distinguish tension members from compression members, an analysis should be done by a structural engineer. The members of concern could be top or bottom chords, diagonals, or verticals.

! **Truss joints.** The truss joints are made up of large gusset plates that connect the truss members. These joints, with their layers of plates, are susceptible to development of pack rust or crevice corrosion. The joints should be inspected closely for pack rust formation and associated loss of section in the gusset plates or members. The gusset plates on the suspended span truss joints and the pins should be inspected for proper alignment and clearances and for possible wear caused by their rubbing together under live load.

- ! **Tack welds on gusset plates, truss members, or floor system members.** Monitor closely for cracks. If any cracks are found, they should be removed by grinding. Test ultrasonically to ensure that the cracks have been completely removed.

Other

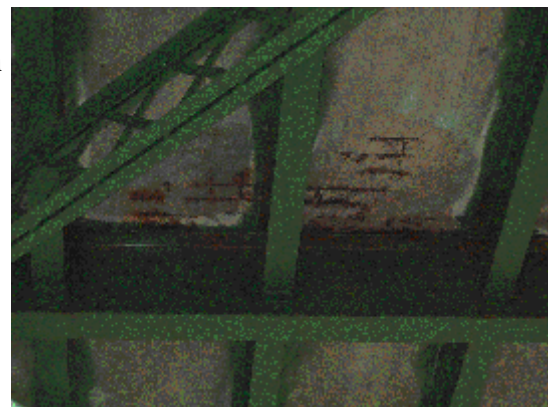
- ! **Truss false chord pins.** The bottom chords of the suspended span in the truss have pinned connections to the cantilevered trusses at either end. These pins should be carefully inspected for wear.

- ! **Reinforced concrete tee beam end spans.** These spans are accessible through manholes in the sidewalks at either end of the bridge or through doors in the abutment backwalls. These areas qualify as confined spaces and appropriate safety procedures should be followed. The concrete should be inspected for cracking, spalling, and general condition.



Inside of Concrete Tee Beam End Span (9)

- ! **Deck.** Monitor condition of the underside of the deck. Compare extent of any spalling found with that documented in previous inspections.

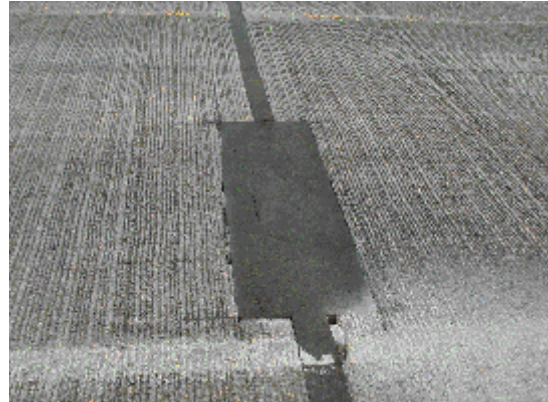


Underside of Deck showing Spalled Concrete and Exposed Reinforcing (10)

- ! **Joints U10 and U12.** The floorbeams at these locations are framed closely into the trusses and could not be painted properly. Also, the bearings for the suspended spans of the truss are enclosed in box members at this location. These areas should be carefully inspected for

development of corrosion and section loss.

- ! **Deck cold joints.** Monitor condition of these joints, including the soundness of any previous repairs. These joints prevent water and dissolved chlorides from penetrating to the steel below. It is important that these joints be maintained in good condition.



Typical Deck Cold Joint (11)

- ! **Erosion.** Monitor any erosion found near the centerline of the bridge at the east abutment. (Erosion at this location can occur when the bridge drainage system is leaking.) Compare with erosion documented in previous inspections.



Erosion at East Abutment (12)

- ! **Truss bearings at piers.** Inspect the truss bearing assemblies, especially the pins, at the piers for signs of unusual wear or cracks. Inspect to ensure they are free to move as intended.



Typical Truss Bearing Pin (13)

- ! **Wind tongue assemblies on end floorbeams.**
These members should be monitored for section loss. The members are wide-flange, steel sections with their webs oriented horizontally. This configuration allows the webs to hold moisture.



Wind Tongue Assembly (14)

Maintenance Recommendations

Regularly Scheduled Maintenance Items

Recommendation	Schedule
Clean bridge drainage system components (deck drains and downspouts).	6 to 12 months
Flush bridge deck joints and check for leaks.	12 months
Powerwash bridge superstructure.	12 months
Powerwash bearings and pin and hanger assemblies. Powerwash pins at false chord locations.	12 months

